

WATER INSOLUBLE DERIVATIVES OF POLYANIONIC POLYSACCHARIDES

Background of the Invention

3124 This application is a continuation-in-part of U.S.S.N. 07/703,254 filed May 20, 1991, which is a continuation-in-part of U.S.S.N. 07/543,163 filed June 25, 1990, now U.S. Pat. No. 5,017,229, May<sup>21</sup> 1991, which is a continuation-in-part of U.S.S.N. 07/100,104 entitled "Water-Insoluble Derivatives of Hyaluronic Acid" filed September 18, 1987, now U.S. Pat. No. 4,937,270, June<sup>26</sup> 1990.

10 The present invention relates to biocompatible films and gels formed from chemically modified polyanionic polysaccharides.

15 Hyaluronic acid ("HA") is a naturally occurring mucopolysaccharide found, for example, in synovial fluid, in vitreous humor, in blood vessel walls and umbilical cord, and in other connective tissues. The polysaccharide consists of alternating N-acetyl-D-glucosamine and D-glucuronic acid residues joined by alternating  $\beta$  1-3 glucuronidic and  $\beta$  1-4 glucosaminidic bonds, so that the repeating unit is  $-(1\rightarrow4)-\beta$ -D-GlucA-(1 $\rightarrow$ 3)- $\beta$ -D-GlcNAc-. In water, hyaluronic acid dissolves to form a highly viscous fluid. The molecular weight of hyaluronic acid isolated from natural sources generally falls within the range of  $5 \times 10^4$  up to  $1 \times 10^7$  daltons.

25 As used herein the term "HA" means hyaluronic acid and any of its hyaluronate salts, including, for example, sodium hyaluronate (the sodium salt), potassium hyaluronate, magnesium hyaluronate, and calcium hyaluronate.

30 HA, in chemically modified ("derivatized") form, is useful as a surgical aid, to prevent adhesions or accretions of body tissues during the post-operation period. The derivatized HA gel or film is injected or inserted into the

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